

moisture and various internal agencies, and other similar subjects possess all the elements required for a good thesis. There are excellent grounds for the belief that vegetable physiology will soon claim as much attention from American universities as minute anatomy did a short time since. At any rate, here is a field to be kept in mind in deciding upon themes for independent investigation.

CURRENT LITERATURE.

A General Treatise upon Fungi.

The fungi have presented many obstacles to a satisfactory treatment within the compass of a single volume, among which are the very large number of diversified forms ranging through a long and intricate series, the obscure polymorphic nature of many of the species, the much reduced structure and curtailed life cycle due to dependence upon organic food supply, and imperfect knowledge of physiological and biological phenomena. Of the several divisions of the subject, systematic, morphological, biological and physiological, we have had more or less well written general accounts of each, decreasing in number and importance in the order named, except of the last. For a knowledge of the physiology of fungi the student has been obliged to hunt up the scattered papers in journals and society proceedings, and incidental references in works upon other subjects. A treatise, therefore, which gives a satisfactory survey of the whole subject of fungi, with the several parts duly apportioned, can not but meet with hearty welcome. Such a work is Zopf's recently published volume on the fungi in their morphological, physiological, biological and systematical relations.¹ The author is well known by his able works upon the lower forms of life and by his numerous important researches.

Of the 500 pages in the volume 115 are devoted to morphology, 110 to physiology, 56 to biology and 204 to classification and development. Upon opening to the first page one finds that the author proposes to include in the work only the true fungi (Eumycetes), and to exclude the bacteria (Schizomycetes) upon morphological grounds as well as of expediency. No mention is made of the slime-molds (Myxomycetes) except in a footnote where they are said to be animals and not plants. The author has given much attention to these outlying groups of organisms and published several monographs upon them, and their

¹ZOPF, WILHELM.—Die Pilze in morphologischer, physiologischer, biologischer und systematischer Beziehung. pp. xii, 500. figs. 163. Roy. 8 vo. Breslau, Ed. Trewendt: 1890.—M. 18.

exclusion from the present work is indicative of a conservative course of treatment.

The morphological part comprises an account of the vegetative organs, organs of fructification including the mechanical contrivances for freeing the spores, the structure and formation of the cell, and its union into systems.

The physiological part opens with seventy pages upon the chemistry of the fungi, which contain a vast amount of information, as may be judged by the fact that there are nearly three hundred footnote references to literature. The part is continued in an account of respiration, development of heat and light, external forces influencing life processes, agents harmful to life, phenomena of movement such as heliotropism, hydrotropism, geotropism, rheotropism, movements due to contact and to chemical and electrical stimuli, and finally nutation and hygroscopic movements.

The biological part treats of saprophytism and parasitism, the means of infection, effect of the parasite upon the host, symbiotism, and the enemies of fungi.

In the systematic part the following classification is used:

- I. Phycomycetes
 - a Chytridiaceæ (*Olpidiaceæ*, etc.)
 - b Oomycetes (*Saprolegniaceæ*, *Peronosporaceæ*, etc.)
 - c Zygomycetes (*Mucoraceæ*, *Entomophthoraceæ*, etc.)
- II. Mycomycetes
 - a Basidiomycetes (*Tremellineæ*, *Polyporeæ*, *Agaricineæ*, *Lycoperdaceæ*, etc.)
 - b Uredineæ.
 - c Ustilagineæ.
 - d Ascomycetes (*Saccharomycetes*, *Erysipheæ*, *Tuberaceæ*, *Sphaeriæ*, *Pezizaceæ*, etc.)

The work is copiously illustrated with well drawn figures, which, however, are not so well engraved and printed as one would expect. A good index of illustrations and another of subjects closes the volume.

Altogether no work of equal importance has heretofore appeared on the general subject of fungi, and its speedy translation into English is much to be desired.

The Silva of North America.

North America has always been noted for its forests, and permanent record concerning them should be made before they have been more extensively devastated. The only work upon the subject, giving detailed

descriptions, has been that of Michaux, supplemented by Nuttall, but this was necessarily incomplete. In the great work¹ now undertaken by Professor C. S. Sargent, the whole subject is to be presented in 12 quarto volumes, superbly printed and illustrated, the first of which has now appeared. Professor Sargent's connection with the forest volume of the 10th census is well known, and no one more competent could have been selected to undertake the work. That the plates will be all that can be desired is evidenced by the fact that the drawings are to be made by C. E. Faxon and engraved by Philibert and Eugène Picart. North American botanists are to be congratulated upon the appearance of this great work, and while its price will put it beyond many private purses, it should find its way into all public libraries, and should be considered a part of the equipment of every botanical department in our colleges. The definition of "trees" is a difficult one, and the author very rationally proposes to follow habit rather than size, a division which will include 422 species, besides numerous varieties. In nomenclature the rule adopted is to use the oldest generic name applied by Linnæus in the first edition of the "*Genera Plantarum*," published in 1737, or by any subsequent author, and the oldest specific name used by Linnæus in the first edition of the "*Species Plantarum*," published in 1753, or by any subsequent author, without regard to the fact that such a specific name may have been associated at first with a generic name improperly employed. Thirty-three species are included in this first volume.

Plants as rock-makers.

PLANTS have long been known to play an important part in the accumulation of travertine, though we doubt whether sufficient credit has been given to vegetation as a geological agent in this matter. In an elaborate memoir² by Walter H. Weed, forming part of the ninth annual report of the director of the U. S. Geological Survey, it is shown not only that very large deposits of travertine are due to the aid, direct and indirect, of vegetation, but also that the extensive deposits of siliceous sinter in the Yellowstone geyser region are in large part due to the separation of the silica from the water by plants.

¹SARGENT, CHARLES SPRAGUE.—*The Silva of North America, a description of the trees that grow in N. Am. exclusive of Mexico, Vol. I. Magnoliaceæ-Ilicineæ* pp. ix. 119, 50 plates, large 4to, Boston and New York: Houghton Mifflin & Co., 1891.—\$25 per volume.

²WEED, WALTER HARVEY.—*The formation of travertine and siliceous sinter by the vegetation of hot springs.* pp. 619-676, 9th Ann. Rep't, U. S. G. S. figs. 5, pls. 10. Imperial 8vo. Washington: Government Printing Office, 1890.

Just how this elimination of silica is accomplished Mr. Weed does not say, and the matter really lies outside his province. Algæ are the chief agents in this work, and in the cooler waters at some distance from the springs mosses also assist. *Cladothrix gypsophila*, *Mastigonema thermale*, *Leptothrix laminosa*, and *Leptothrix* sp.? are the chief filamentous forms found growing in the hot waters. Various diatoms, *Denticula valida* in particular, eliminate silica from the tepid waters of the marshes about the Hot Springs, and their dead tests make up the bulk of the ooze which forms the soil of these marshes. The moss found in the warm waters was *Hypnum aduncum* var. *gracilescens*. The memoir is an interesting contribution to the knowledge of vegetation as a geological agent.

Minor Notices.

WITH THE APPEARANCE of Part V, devoted to Pteridophytes, Professor John Macoun's Catalogue of vascular Canadian Plants has been completed. It has been very handsomely done and the painstaking care so evident through it all has made it a mine of information concerning the Canadian flora. The present part brings up the generic numbers to 764, the specific to 3,054. A large appendix brings together additions and corrections to Parts I-IV, the results of all monographic work done since the beginning of the catalogue being included. It is promised that Part VI, soon to appear, will include Characeæ, Musci, and Hepaticæ, about 1,000 species in all. The part is rounded out by a complete index to all the parts, and the five will make a very complete and compact volume.

ALONG WITH the preceding comes a list of Canadian Hepaticæ, by Wm. Hy. Pearson, published in the same style, and containing 12 full page plates.

OPEN LETTERS.

The word "Biology."

An open letter from a "Prominent Zoologist" brings a breath of "*Bion*" into the October *Gazette*. In it, an original and characteristically unsearchable defence is proposed for the current etymological piracy *in re* the word "biology." It is probably the same "prominent zoologist"—if one may judge by kinship of orthographic recklessness—who presents, editorially, in the Nov. *American Naturalist* a similar sin against rational use of terminology. The argument perpetrated by the GAZETTE letter and perpetrated in the *Naturalist* editorial is as follows: "Zoologists were the first to study life; therefore they have a prior right to the word *biology*." The truly "biological"